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ABSTRACT

This paper describes one pioneer effort to develop materials for teachers who operate on the premise that the student can learn from his environment. Three environments are considered: 1) the inner environment of the child; 2) the immediate environment in which he finds himself; and, 3) the global environment which is of so much concern to mankind. Instead of asking a student to respond to a textbook abstraction of his environment, the student is allowed to choose the investigations which in turn will serve to structure the course content. Further, the student's self-image is enhanced by allowing the emotional self to be as apparent as the logical and rational self. It is hoped that the materials "Investigating the Earth" reflect the notion that in true self-directed inquiry situations students have access to the entire process of research. Finally, an early pilot effort with inner-city ninth graders is documented. The students were asked to "go out and photograph evidence of change"; they then had to decide on the operational definition of change, what the evidence for that change was, and photograph that evidence. (SBE)

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INTRINSIC SCHOOLING: A NEW YELLOW BRICK ROAD

By: Robert E. Samples

Tilford was the biggest guy in the class and it was pretty obvious that he greeted school with a healthy suspicion. He was the one that led the class in the exclamation, "You mean we're goin' outside? You mean outside the school?" That we said we were going outside didn't seem to Dorothy Curtis and me to be such a source of amazement, but it certainly did to the class. They were ninth graders and it was a junior high school in a large city, and we were about to attempt to get a pilot approach to Environmental Studies under way. It seemed perfectly obvious to my colleague Dorothy Curtis and me that the best way to study an environment was to get out into it.

There was a moment of bewildering confusion when the students were asked to get their coats, as they had never before needed them until school was dismissed. The hall patrolmen glowered their disapproval at the students who babbled their confusion to each other amid their locker door version of the "Anvil Chorus." When they had finally gathered up their coats and returned to the room it occurred to someone to ask what we were going to do outside.

"We are going to go outside and photograph evidence for change."

"Photograph? You mean take pictures?"

"What are we gonna take pictures with?"

By this time Dorothy and I were unpacking a half-dozen Polaroid Swinger cameras from a box we had carried in. I asked the students to divide up into five-man teams so that each team could have a camera. They quickly broke up into a reasonable facsimile of five-man teams, but the perfection of the symmetry was strongly influenced by personal friendships. There were six-man teams, three-man teams and even one seven-man team. The students were all ready to argue the validity of their assemblage of teams but never had the chance to as we didn't complain about the unevenness of their grouping. Instead we passed out the cameras and film.

"Do you people know how to use these cameras?"

"Sure, man." And the snatched them from our hands.

Armed with cameras and film, we left and locked the room, passed the glowering hall patrolmen, and proceeded out the locked school doors into the outside world.

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ESCP's Instructional Materials Development Program had for a long time considered the creation of Laboratory Block materials that represented extensions of the Investigations in Investigating the Earth. Through exploratory work done at two NSF-funded leadership conferences, guidelines were set to assess the need for such materials.

The conferences and two advisory group meetings with urban educators from various parts of the country suggested strongly that the new materials should be more than mere extensions of earlier investigations. In fact, nearly all the advice suggested that we carefully rethink purposes of instructional strategies and the nature of materials for student use.

We at ESCP knew that the materials we had created for Investigating the Earth, though a remarkable step forward in earth science education, were not panaceas for all students. In addition, we were sensitive to the fact that the content progression of the text had determined the kinds of investigations that provided the actual experience for the students. In a manner of speaking, the content was served by the investigations, rather than the opposite. Though there is merit in such an approach, our advice from the advisory sources strongly recommended that we reverse the procedure. That is, we should let the investigations serve to structure the content. In addition, the argument became stronger that we should let the students choose the investigations.

Everyone whose council we sought suggested that many of the students in the cities were strongly alienated. They felt we should be as concerned about lessening the qualities of alienation as we were about conveying content and concept. Further, we were told in corrobration with our own ideas that the students' self-image must be enhanced; that self-confidence and an awareness of one's aspirations, capacities and potentials are vital in creating a viable human being.

"Do you know how to load those cameras?"

"Yeah....sure!"

With the students' assurance of expertise, Dorothy and I retreated to a neutral area and began an animated conversation that allowed us to watch the gaggle of confused students attempt to load the cameras. The frustration we experienced in trying to ignore the inept way these students proceeded with the task was excruciating. They had lied when they said they knew how to load the cameras, but they most vehemently wanted to succeed. Finally Tilford edged away from the group and approached us.

"This ain't the model I got at home."

"So?" I said.

"Can you load it for me?" he said.

"Sure." And I loaded the camera carefully, slowly, and even discovered I needed to check the procedure again so as to be sure it was correct. Tilford watched with a total kind of involvement. When I handed him the camera he went quickly back to the group and conducted an in-service course in loading Polaroid Swingers.

Everyone quickly became involved in taking pictures. They took pictures of each other, of the school grounds and of anything else that came into their minds. That is everyone but Tilford. His leadership qualities were confined to getting everyone else going, but he wouldn't take a single picture of his own. When I asked him if he had taken any his answer was, "Naw....I'd just mess up."

In creating curricula, scholars and educators have always concerned themselves with content. Since content had been the fiber of the classical curricula from the time of the Greeks, there was little precedent for totally abandoning history. Content was still to be served. However, those who wrote curricula after the now-famous Woods Hole conference in 1958 focused on two qualities of content: one, its basic inherent rational structure; and two, how the human intellect accumulates knowledge. Jerome Bruner and others were some of the best possible spokesmen for the times. Physicists, chemists, biologists, and anthropologists were eager to try to discern the inherent structure of their areas of academic expertise. The psychologists had arrived at recipes for the workings of the rational side of the intellect and, at this Sputnik-spurred turning point in national embarrassment, rationality was easily identified as the quality that would get us through.

The curriculum-makers took the cue from the times. A logical, internally consistent approach to the structure of knowledge and the techniques of the acquisition of knowledge was all one could ask for. Onward to the books, the equipment, the lab manuals, the teacher's guides that now nostalgically populate our classrooms. Ten years later other voices began to provide a counterpoint melody to the tunes of the first decade of curriculum revision. The counterpoint had to do with <u>the other half of the human being</u>. A decade had been invested in what one knows. Now the murmur

was focused on how the human being feels.

"You'll what?"

"I'll just mess it up!" Tilford said. He looked at the ground. I grabbed as quickly as I could at the inadequate straws of my experience. I knew he could do it, but that suddenly became unimportant because I realized—he didn't know he could do it! I then became aware of the unused film in my right hand. I said as casually as I could:

"Hell, man....nobody can mess all this film up!"

It was as though everything became heavily weighted as in a dream, and the world slowed to a stop. Tilford looked at me, then turned and took the camera from his group. He gestured to two girls and a boy and directed them into position, and then I think he smiled at me as he raised the camera to take their picture. I closed my eyes and prayed that if ever a picture turned out this one would....

Currently a host of psychologists are vitally concerned with how people feel in the learning process. These psychologists along with other varieties of social critics have attacked the coercive institution called the school. Their argument is clear. They defend the students' right to "feel good" as well as to "know good." Some of those who have acted as spokesmen for this effort are John Holt, David Hawkins and Leonard Engle. All seemed to influence the pragmatic approach of Postman and Weingartener in their Teaching As A Subversive Activity. Their arguments can be summed up in the claim that school and what happens in it should be more compatible with the social and personal condition called life.

Meanwhile the ritualistic enterprise through which curriculum-makers inform young people of the structure of knowledge became known as the "new" in school. In addition, if it was "really new" its strategies and tactics were guided by cognitive psychologists who regimented not only what a person can know but how they can know it. All the while the murmuring group asking, "How do they feel?" began to get stronger.

Recently Dick Jones put a fine argument for the case in print with his Fantasy and Feeling in Education. Jones argued, as does Michael Polanyi in The Tacit Dimension,

for that fantastic realm of intuitive knowledge that sculptures our preconscious thought processes. To put it more simply, we each have emotional-intuitive inputs into our lives as well as rational-logical inputs. Schools for generations have been concerned with that which was rational and logical. Jones and others are making a strong plea for allowing more access to the emotional and intuitive in the educational process. They argue that we should, in school as in life, allow the emotional self to be as apparent as the logical and rational self.

The sound of Tilford's camera shutter pealed like thunder above timberline. He seemed to take ages pulling the tab and picture pack from the Swinger. But when he did I don't remember breathing for the ten seconds needed for the positive to develop. I swear he smiled at me before he stripped off his perfect portrait of Linda, Amelia and Ernie. He handed it to me with the pronouncement:

"How you like that man?"

"I guess that's pretty good." I grinned.

Arguments about what one can do to make students feel better fall into two camps. One group argues that, by predetermination, activities for the young can guide students into intellectual involvement that insures that the cognitive psychologists' intellectual progressions are met. These same theorists are convinced that the student's sense of self-worth is nourished by his ratio of success in conforming to the external intellectual criteria that they have in circular argument set up as standards for success.

The other camp is more suspicious. They argue that conformity to external criteria is a trivial indicator of personal success. This group argues that those qualities <u>inside</u> the child are more important than those outside the child. In essence their position is that, regardless of the nature of the external coercion, the important thing a child can know about himself is that which resists conforming for the purpose of sustaining personal honesty. The clichés put it this way: A child who knows himself will learn more capably than a child whose entire extrinsic response is toward adult coercion. That's a nice cliché and it could easily be disproved if it

weren't true. This internal or intrinsic group wants to see the fruition of the individual potential, aspiration and capacity in the presence of what happens to the child in the process of education.

As an example, students working in the presence of ambiguous assignments which require personal or intrinsic definition become quickly self-reliant. Their arguments become concerned with how to meet the constraints of the assignment as <u>they</u> see it, as opposed to how <u>I</u> (as teacher) see it. Upon getting involved in this fashion, the students all develop acumen in meeting the goals that each sets for himself.

The teacher's role is to focus on making each student reach in the direction in which he points. Since 'change' provides conceptual as opposed to content constraints, the students have far greater degrees of freedom than otherwise. This tactic is compatible with the Environmental Studies approach. Ambiguity has a higher potential for relevance than does specificity. In the face of ambiguity concerning a conceptual topic (like "change") a student has a far higher potential for serving his own (intrinsic) needs than he does if the teacher announces, "Go outside and get evidence for erosion." Erosion is content, whereas change is conceptual. Conceptual involvement is far less constraining than content.

Tilford then engaged in an activity that rejuvenated all my anxieties. He got involved with proving that the sun apparently moved. His technique was to go to the south side of the school and photograph the sun atop a steeple of a church adjacent to the school. He positioned himself so that the sun was directly aligned with the steeple. His next problem was to learn how to override the YES electric eye system of the camera so as to get an adequate picture of the sky and sun. He asked no one how to do this. It was all determined after a thoughtful stare at the camera mechanism. The proper adjustment was made and the picture was taken.

It was beautiful. Intertwined among the lacy branches of November trees, the sun sat in a starburst pattern, perched upon the top of the church steeple. Immediately I wondered if Tilford would be clever enough to mark the point at which he took the photograph so he could return to it later. I almost started forward to tell him. But then he relieved my concern with a great smile across his black face....

Creativity research is replete with data that testify to the validity of openness. These data are philosophically in conflict with the tendency toward step-by-step organization (either content-focused or psychologically focused) of modern curriculum offerings. The researchers in creativity have found that divergent thinking is the most rewarding quality in the early stages of problem solutions. These same researchers do not discredit the convergent thinking that inevitably emerges in the final stages of solving problems. However they voice concern about the pressure toward convergent thinking established in modern curricula as a result of the content and process biases.

The research coming from research models created to insure content integrity and cognitive integrity has biased the scene so that we are only currently becoming concerned with the qualities of divergence in creativity research. In the tradition of our Judeo-Christian heritage we have been coerced into believing that virtue lies within the tidy boundaries of logic and internal consistency. Psychologically, convergent thinking was most compatible with such a philosophical view. History, however, does not allow such an operational view to prevail. The great historical turning points were always accompanied by divergent production. The Renaissance, whether Arabic or Christian, was a refutation of convergent, internally consistent traditions of the contemporary scene. Bacon's break with Aristotelian precedents freed science from dogma and plunged it into an age of experimentation.

In education there seems to be a tacit assumption that the greatness of an individual student will exceed the constraint of the times. To me, the urgent question of modern education is simple..."Why wait?" Why should we as educators, in an effort to preserve the sanctity of precedent, wait for students to exceed our constraints <u>when by changing the constraints we could insure it</u>?

Tilford (thirty minutes later) returned to the south side of the school. I had followed him and had promised myself that I would offer no cogent, adult, educated guidance (commonly called interference). I just stood there. Tilford looked at his first picture and sidled about on the sidewalk. Eventually he was happy with his position and he took the second picture of his sequence. He was sure he had photographic evidence that the sun apparently changed its position in the sky.

I wanted, with my adult experience, to run up to Tilford and announce to him the names of the Greeks that had wrestled with the problems he had only moments ago confronted. I wanted to pour forth the rational verification of Tilford's intuition. I would have involved the names of Eratosthenes, Ptolemy, Galileo, and even Brahe. But somehow I avoided the compulsion to inform Tilford that the brilliant insight he had just gained had preceeded him by 2000 years.

Somewhere down in my viscera I was able to avoid putting Tilford down by citing precedent. That history is replete with men who have thought our thoughts is no excuse for us to avoid thinking them. Minds explore independently of time. Only societies and historians are time conscious.

The burning question is....<u>can curriculua be written that can insure that we will create environments in which students can intrinsically emulate Eratosthenes, Ptolemy, Galileo and Brahe</u>. The evidence so far suggests that it is possible. We are hopeful that with appropriate admixtures of ambiguity and trust students will be able to re-create and pro-create thought patterns that will accomplish two purposes. The first is that through involvement with actual and real environments the student can experience data sources that can promote the replication of classical scientific thought patterns. The second is that by utilizing primary sources of data, such as the actual environment, students will become more confident in themselves as instruments of inquiry.

The materials we hope to develop will reflect the notion that in true self-directed inquiry situations students have access to the entire process of research. Giving ambiguous directions such as, "Go out and photograph evidence for change," forces the student to begin the inquiry episode by making a series of decisions. He must decide on an operational definition of change, then decide what the evidence for that change is, and then attempt to photograph the evidence. Because "change" has more of a conceptual quality as opposed to a content quality the students' arenas of inquiry are less defined.

Such "forced" decision-making, in concert with the ambiguity of the assignment, quickly turns the effort into something that is more child-sponsored than teacher-sponsored. Although it is true that the initial assignment is a teacher-stated, extrinsically moderated directive, the students quickly take over.

Tilford's photographs were masterpieces of proof. By comparing the foreground of each of the pictures it was clear that the branches of the trees were identically matched. He had returned to nearly the exact spot from which he had taken the first picture. I knew I wouldn't have attempted the same task without a tripod. In addition, the starburst pattern of the sun had shifted appropriately to the right. Tilford had his proof.

The rest of Tilford's team used a variety of other techniques to prove the sun's apparent motion. He was active among the team members and assisted them in getting over hurdles of their own. They were all deeply engrossed in making marks on the sidewalk, photographing shadows and sketching shadow patterns on the side of the school building when a loud yell slammed down from above.

"Hey, you take my picture."

It came from one of several now open windows on the third floor of the school. Others chimed in with garishly animated gestures.

"Mee toooo."

"I'm beautiful."

"Look at me." It was obvious the teacher was out of the room, so I started to say something, But I was too slow!

"CLOSE THEM WINDOWS!" exploded from my right. It was Tilford. Let me tell you, THEM WINDOWS CLOSED. Tilford and some members of his group muttered among themselves about "them damn kids could queer this thing for us."

I didn't say anything. After the time we spent outside was finished we started back into the school. I noticed several of the class members picking up the debris from the Polaroid film wrappers. That's <u>all</u> they picked up, however. The school ground remained covered with trash and food wrappers, but they had picked up <u>their</u> mess.

All the students in the class accepted and demonstrated responsibility in a variety of ways. Other faculty members in the school had warned Dorothy and me that "these kids have no sense of responsibility. They will break or steal the cameras."

Because of this we immediately gave the students the right to check out the cameras for home use. They could even take them home on weekends. We still have the original set of cameras....intact and working.

These early pilot efforts provided a basis for the work we are currently doing. With a sizeable grant from the Polaroid Corporation, we have equipped about 40 teachers in 10 cities across the country with the pilot materials. At the briefing meetings we had with these teachers we were excited by the intensity of their concern about meeting the needs of the young. In our discussions we agreed that in free instructional environments the real needs of students would prevail. This had been proven in our experience with the inner-city ninth graders. None of these students asked questions about the management aspects of the class. No one wanted to know how we would grade. No one asked how lab reports should be filled in. No one asked about how they should organize their data. Instead they made all these decisions themselves and asked other kinds of questions such as these:

"How can I take two pictures on one?" (double exposure)

"How can I get pictures at night?"

"Where can I get a brick so I can find out how long it takes to wear down?"

"Where do they take all the garbage?"

"Can I take pictures of the stars to see if they move as fast as the sun?"

Somehow the experience left us with a warm conviction that school can be made more like life. The students had nurtured their interests and at the same time accumulated knowledge. By focusing on the immediate environment the students could return to their data sources if they needed more information. In doing so they begin to be more alert to the nuances of strangeness in their commonplace environment. Bushes they had passed a hundred times became sources of information. Even the cracks in sidewalks developed new meaning. In addition, they began alerting themselves to each other as people.

Did we succeed in any significant way? We cannot be sure, but we did feel pretty good when we discovered several members of the class sneaking back into school to attend this one class each day.

THE END

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